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TECHNOLOGY SEPT.

August 25, 1951

SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Baby at the Zoo

See Page 114

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MEDICINE

Colds May Lead to Polio

Sore throats and sinus trouble also may pave the way for infantile paralysis, evidence from outbreak in boys' school indicates.

► **BAD COLDS**, sore throats and "sinus" trouble may pave the way for an attack of poliomyelitis, or infantile paralysis as it is also called.

Evidence suggesting this is reported by Drs. Theodore H. Ingalls and W. Lloyd Aycock of Harvard. (*NEW ENGLAND JOURNAL OF MEDICINE*, Aug. 9).

The evidence comes from heretofore unpublished findings about an outbreak of polio at St. Mark's School for boys at Southboro, Mass. The outbreak occurred in the last half of May, 1936. This, the Harvard scientists point out, was an off-season in an off-year for polio.

Among the 190 boys at the school, 22, or 11%, were attacked by polio between May 16 and June 1. During all of 1936, there were only 60 cases of polio reported for the entire state of Massachusetts, which had at that time population of almost four and a half million.

This "explosive" outbreak at St. Mark's came at the end of a spring season when there had been more cases of nose and throat infections, colds and sore throats, than in the next 10 years. In April and the first half of May, 52 boys had colds or similar upper respiratory infections bad

enough so they had to be sent to the school infirmary.

During the period of May 1 through May 20, almost half, or 41%, of boys who later developed polio had colds, while only 19% of others in the school had such illnesses. The interval between the two types of illnesses in 10 boys averaged nine and a half days. The incubation period for polio, that is the period between the virus getting into the body and sickness developing, is generally put at seven to 14 days.

An upper respiratory infection, such as a cold, is only one of a number of factors that may predispose to polio, the Harvard scientists point out. Removal of tonsils and immunizing "shots" against diphtheria and other diseases have been reported as predisposing to polio if done during the month before a child is likely to be exposed to the virus.

These factors, the Harvard doctors suggest, may explain why big polio years come and go without the rhythm or predictability that characterizes childhood diseases such as measles in which the factor of exposure determines the presence or absence of disease in susceptible persons.

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NUTRITION

New Nutrition Stars

► **VITAMINS** are being pushed into the background. Antibiotics, such as penicillin and aureomycin, are the new stars in the nutrition picture. This change and what it means for the future are pointed out by Dr. H. R. Bird of the U. S. Department of Agriculture's Bureau of Animal Industry. (*SCIENCE*, Aug. 10).

Man and his domestic and pet animals will, of course, continue to need vitamins in their daily diet. But, Dr. Bird says, accepted figures for amounts needed of known vitamins and other nutrients will need to be changed. The importance of micro-organisms—germs to the layman—in the digestive tract of non-ruminant animals needs to be re-evaluated.

"The opportunity to increase materially the efficiency of meat production" is the third consequence he foresees from discovery of the the nourishing role of antibiotics originally developed as remedies for germ infections.

"Research in nutrition has been dominated by vitamins for 30 years," he states. "This

domination is by no means ended, but the time must come when the last vitamin will be apprehended, catalogued, civilized and put to work."

In a way, it was the vitamins that led to discovery of the growth-stimulating action of the antibiotics. This had first been discovered at the University of Wisconsin in 1946. Researchers there found then that feeding streptomycin with an experimental purified diet stimulated the growth of chickens.

The nutritional role of the antibiotics was rediscovered in 1950 incidentally as a result of the development of vitamin B-12 concentrates from by-products of antibiotic manufacture. Some of these B-12 concentrates were more effective than others in stimulating growth. The extra effectiveness was traced to the antibiotic left in the concentrates.

The usefulness of antibiotics for nourishment seems to be limited to growing non-ruminant animals. In the diet of ruminants, such as cows, they are harmful.

Dr. Bird's figures show that about 5% of the animal production of aureomycin, penicillin and terramycin would be needed for the annual production of three and one-half million tons of broiler chicken feed.

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ZOOLOGY

New York Zoo Has Baby Lowland Gorilla

See Front Cover

► **A NEW BABY** gorilla has been adopted by the New York Zoo. He will replace Makoko, the much admired Lowland Gorilla that recently was accidentally drowned in the moat which serves to enclose the animals without bars.

The baby is named Mambo. Probably a little over a year old, he is now in the Animal Nursery where he follows a routine not very different from that of a human infant. He is fed four times a day—cereal, vegetables and fruit, milk and vitamins. He takes a bottle like a baby, being fed by Mrs. Helen Martini who is responsible for his care.

The picture on the front cover of this week's *SCIENCE NEWS LETTER* shows Mambo enjoying his daily grooming at Mrs. Martini's hands.

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GENERAL SCIENCE

Iron Curtain Countries May Get U. S. Journals

► **THE BAN** on the mailing of technical and scientific publications to Russia and the Iron Curtain countries is to be lifted, John Donovan, chief of the Technical Data Section, Office of International Trade, Department of Commerce, told *SCIENCE SERVICE*.

The ban was put into effect March 2 and prevented Iron Curtain subscribers of magazines—available on American newsstands or in libraries—from receiving their copies by mail.

A similar ban on the export of unpublished technical data will remain in effect, however, Mr. Donovan said. This would include detailed drawings of apparatus, plans of factories and other material not generally available to the public.

The ban on magazines raised protests from scientific and engineering societies when it was put into effect in March. They pointed out that their magazines were readily available to anyone who wanted to read them and that the ban would in no way keep the information in the magazines from the Communists.

It was also pointed out that scientific and technical journals do not publish classified information.

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MEDICINE

New Poison Ivy Remedy

Zirconium used in a vanishing cream type of ointment stopped itching and burning for 39 out of 47 patients. It combines with other substances to neutralize them.

➤ A NEW and speedy remedy for poison ivy has been found in zirconium, metal used to build atom bomb furnaces among other industrial uses.

The zirconium is used in a vanishing cream type of ointment. When tried on 47 patients, the itching and burning stopped and the rash began to get better with blisters drying up within 24 hours in 39 patients.

These good results are reported by Drs. G. Arnold Cronk and Dorothy E. Naumann of the Student Health Service at Syracuse University. (JOURNAL OF LABORATORY AND CLINICAL MEDICINE, June).

There is some suggestion that the ointment might even be a preventive. Before it was used on patients, it was tried on two volunteers, a girl and a woman who had previously had several attacks of poison ivy. A poison ivy extract was dropped on three places on the forearm of each volun-

teer. As soon as this had dried, the zirconium ointment was put on one of the three places while the other two on each arm were left untreated. Typical bumps and blisters appeared on the untreated spots but none on the treated ones.

The idea for using zirconium came from Dr. E. Wainger of the Titanium Alloy Corporation. He knew that the metal can combine with other substances in a way that makes possible their neutralization as poisons. This property makes it a potential antidote for plutonium poisoning. He found that when he added zirconium salts to urishiol, the poison of poison ivy, an inactive precipitate was formed. Fluid filtered from this did not cause ivy poisoning symptoms when tested on susceptible volunteers.

So far as is known, zirconium itself is not poisonous. The patients treated by the

Syracuse doctors did not show any signs of poisoning or harm from the zirconium.

The zirconium ointment is made from zirconium oxide, stearic acid, potassium hydroxide, glycerine, water and carbon dioxide.

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PLANT PATHOLOGY

Two New Chemicals May Protect Apples and Peaches

➤ TWO NEW chemicals now being orchard-tested in Beltsville, Md., show promise of controlling some of the diseases that attack and spoil apples and peaches.

The two compounds are so new that U. S. Department of Agriculture scientists do not yet know whether they are harmful to man or animals. If present, small-scale orchard tests prove the compounds as successful as expected, their effects on man and other warm-blooded creatures will then be investigated.

Some of the diseases controlled by the two chemicals, 2,2'-thiobis(4-chlorophenol) and bis(p-nitrophenyl) ester of carbonic acid, include: apple scab, Brooks' spot, bitter rot and sooty blotch on apples; and peach scab, brown rot and bacterial spot on peaches.

Studies to find some way of predicting what compounds will make good insect killers and disease controllers brought to light the two chemicals, as well as three other promising ones available only in very limited amounts. Exactly 412 synthetic organic chemicals have been tested in the last three years, Drs. M. C. Goldsworthy, senior pathologist at the Department of Agriculture's Plant Industry Station, and S. I. Gertler, chemist with the Bureau of Entomology and Plant Quarantine, report.

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ANTHROPOLOGY

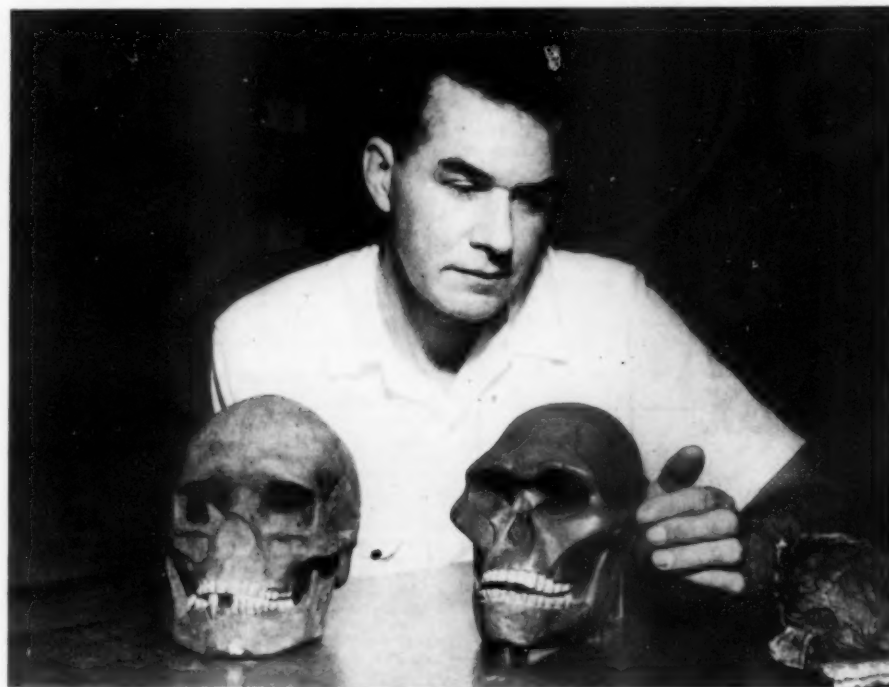
Ancient Ape-Man Walked Like a Man

➤ AN ANCIENT creature with the face and brain of an ape walked like a man. He is Washington's latest VIP.

He is represented at the Smithsonian Institution by the exact casts of a few fragments of his bones which have been preserved as fossils in the limestone of South Africa for from 750,000 to 2,000,000 years.

The original ancient bones of this ape-man were found by Dr. Raymond A. Dart, of the University of Witwatersrand, Johannesburg, in ancient caves at Makapans in the Central Transvaal.

The South African Ape-man may have been intelligent enough to use fire to cook his dinner. This was indicated by fire-charred bones found near the site where some of the bones were located and believed to be of the same antiquity. Dr.



APE-MAN SKULL—Dr. M. T. Newman, anthropologist of the Smithsonian Institution, points to the prominent cheek bones, ape characteristic of this very ancient skull. The skull cast, recently received, is a restoration made by Dr. Raymond A. Dart, of South Africa, on the basis of fossil bone fragments he found in the Transvaal. The cheek bones, eyebrow ridges and prominent upper jaw mark the animal as an ape, yet the way the skull was balanced, the pelvis, and leg bones show that it walked erect like a man. At the left is shown a skull of modern man for comparison.

Dart has therefore named him *Australopithecus prometheus*, which means "southern ape that used fire."

Dr. Dart also found evidence that the ape-man used weapons to kill game by bashing in their skulls. They also killed one another in this violent way.

GENETICS

He-Men Have More Sons

Theory advanced that ratio of boy to girl babies is controlled by genes acting through endocrine glands, especially sex hormones.

► THE MORE he-man Daddy is, the more likely that he will father boy babies. And the reverse.

This theory is advanced by Dr. Marianne E. Bernstein, Fulbright fellow at the Institute of Statistics in Rome, Italy. (SCIENCE, Aug. 17).

Dr. Bernstein believes that the ratio of boy to girl babies is controlled by the genes acting through the endocrine gland system, especially the sex hormones.

Fathers suffering from gland disturbances, such as gout and Graves' disease which is a thyroid gland disorder, had more than the average number of female offspring, she found.

Bald men, Dr. Bernstein found, had 40% more male offspring than men with full hair or with receding hairline that had not developed into full baldness. And male hormones, she points out, play a role in the development of baldness.

Dr. Bernstein believes that men engaged in aggressive occupations in which few or no women have been outstanding are

The important bone casts received include parts of the jaw and skull and also a very human-like pelvis bone. The form of the pelvis and the way the skull was balanced show that the animal stood erect.

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more masculine than men engaged in introvert, retiring occupations.

Dr. Bernstein's statistical studies showed that in families where the fathers were in such occupations as members of the armed forces, business executives, politicians, lawyers, farmers and abstract scientists such as astronomers and mathematicians, the sex ratio of 5,400 children was 120 boys for every 100 girls.

In families where the fathers followed professions in which many women have become famous, such as actors, social workers, child educators, fiction writers and artists of all kinds, the sex ratio for 1,800 children was 85 boys for every 100 girls born.

Dr. Bernstein theorizes that the X-bearing sperms, because of their female chromosomal balance, form a foreign entity in the male reproductive organs. They are therefore destroyed in smaller or larger numbers inside the male, depending on his degree of maleness.

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RADIO

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WILDLIFE

Rise and Fall of Animals Is Chance

► CHANCE APPEARS to dictate yearly variations in the number of wild animals—whether lemmings, snowshoe rabbits or lynx.

There probably is no "mysterious" cause for the observed regularity of population cycles in animals, concludes Dr. LaMont C. Cole, zoologist at Cornell University, Ithaca, N. Y.

Yearly changes in the numbers of various animals could be brought about through

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the influence of many small haphazard factors, storms, floods, fires, dry spells, etc. Each of these or any combination of one or

more of them might occur in any one year, their total effect being entirely random.

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RADIO

Trans-Continent Television

Coast-to-coast TV network made possible by opening of a transcontinental radio-relay system for radio telephone and also television.

► TELEVISION transmission across the continent has now become possible with the opening of a transcontinental radio-relay system installed by the American Telephone and Telegraph Company. It is primarily for telephone service but it also will provide a coast-to-coast TV network.

This radio-relay system will permit for the first time telephone conversations across the country by radio rather than by wire or cable. The eastern half has been in use for some time and is already sending television programs as far west as Omaha.

The new western half, now opened for telephone, is expected to be equipped to handle east-west television by the end of next month. Another channel, west to east, will be in service a few weeks later.

This radio-relay installation, the longest microwave system in the world, uses 107 relay towers spaced about 30 miles apart. Each picks up the radio signals from a tower to its east or west, amplifies them

and retransmits them beamed on the next tower in the line.

Messages will ride super high frequency radio waves in the 4,000-megacycle range. This means 4,000,000,000 cycles. Ordinary radio broadcasting range is from 550,000 to 1,600,000 cycles. Radio waves used in the relay system are about three inches in length as against the 1000-foot waves for frequencies in the middle of the standard broadcast band. Amplifying equipment in each relay station boosts the power of the radio signals 10,000,000 times.

What makes this new relay system possible include a new electronic tube which gives super high frequencies, a greatly improved metal lens and a unique system of filters representing an entirely new contribution to the field of communications. This radio-relay is not intended to replace present transcontinental wires and cables. It will supplement them.

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GENERAL SCIENCE

Urge Full Funds for NSF

► POINTING to the "desperately critical situation" in the United States with respect to scientific manpower and the lack of basic knowledge which "seriously delays" technical progress in field after field, Dr. Alan T. Waterman, director of the National Science Foundation, has urged Congress to appropriate the full \$14,000,000 it requested for the fiscal year 1952.

Dr. Waterman's statement was made after the House Appropriations Committee had cut the budget request down to \$300,000. No money was to be allowed for either a fellowship program or research support at educational institutions, the statement stating that the committee "after much consideration and with some reluctance, has denied funds for these two programs, which make up in excess of 90% of the estimate, with the idea that their early aid in the present emergency is not very tangible."

The House was to have acted on the appropriations bill early this week, but scientists were pinning their hopes on the Senate for at least partial restoration of the cut.

In his statement Dr. Waterman pointed to the desperate shortage of scientists, en-

gineers and technicians. He said that the number of engineering graduates would decline at an alarming rate during the next three years.

"The defense budget has increased fourfold and the military research and development effort more than threefold," he declared. "The demand and urgent need for scientists and engineers will rise accordingly. Instead, the supply is decreasing in inverse ratio to the demand."

Of the \$14,000,000 asked, \$5,060,000 was to be for the support of 2,100 graduate fellowships in the sciences and engineering, he said.

"Research support has equal bearing on the emergency," Dr. Waterman stated. "Today, the time-lag between the discovery of a basic scientific principle and its exploitation and application has all but disappeared in great technological areas, many of significance to defense."

Dr. Waterman declared that this country needs a defense in depth in research and development.

"This means," he pointed out, "that we must mobilize all of our technological resources—basic research, applied research, development, engineering and production



RELAY—This is one of 107 radio relay stations on the Long Lines transcontinental system. The relays are mounted on a 200-foot steel tower.

know-how. Ideas alone can give us the vital margin of superiority in technological warfare, and original ideas spring from basic research.

"We dare not forget the lesson of the last war. In 1940 the Nazis stopped their research. They thought the war could be won on weapons and warfare devices already developed and in production. Three years later they tried desperately to restore a strong research effort. It was then too late. They missed three of our most important military assets: microwave radar, the proximity fuse, and the atomic bomb.

"We cannot afford to miss."

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INVENTION

Improved Aviation Gasoline Betters Operation and Power

► BETTER FUEL of the high-octane type for military and civilian airplanes is claimed in a composition which brought patent 2,560,898 to Walter A. Schulze and John E. Mahan of Bartlesville, Okla. Phillips Petroleum Company, Bartlesville, has been assigned right to this improved fuel.

The product is what chemists call an isoparaffinic aviation fuel. This contains a relatively minor proportion of a compound which gives rich-mixture characteristics without undesirably affecting the other characteristics of the fuel. The additive is minor portions of methyl substituted pyridines.

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ASTRONOMY

Sun May Be Blue, Too

Once in a blue moon, the sun may also be seen as deep indigo blue. Caused by smoke layer in the upper atmosphere.

► ONCE in a blue moon, there is a blue sun.

Scientists at the British Association for the Advancement of Science meeting in Edinburgh were assured by R. Wilson, of the Royal Observatory, Edinburgh, that the sun as well as the moon sometimes is a deep indigo blue. It happened in Edinburgh on Sept. 26 of last year. This remarkable phenomenon was first noticed at about 4 p. m., when a thinning out of cloud enabled the solar disk to become visible as a deep blue. From then on it could be seen through the cloud for considerable periods up to sunset. The phenomenon continued into the night when a "blue moon" was also observed. Next morning, the sun was normal.

The phenomenon was caused by a smoke layer in the upper atmosphere extending from 30,000 to 40,000 feet which cut off red light while allowing the passage of blue light. The source of this smoke layer was extensive forest fires burning in Alberta, Canada, on Sept. 23. The smoke from these fires drifted over North America, across the Atlantic, over the British Isles and then across to Europe where it finally dispersed.

To investigate the physical nature of the smoke layer, the 36-inch reflecting telescope of the Royal Observatory was trained on the "blue sun." By means of an instrument attached to the base of the telescope, the light was separated into its different wavelengths and its spectrum photographed. By repeating the procedure at a later date

in the case of the normal sun, a comparison of the two led to a determination of the actual loss of light at each wavelength, caused by the smoke layer. The results showed that while the layer was bluing the sun in the visible region of the spectrum, it was doing the reverse in the ultraviolet and reddening the sun.

The investigation showed that the particles in the smoke layer were not blue but transparent and that the red light lost in its passage through the layer was not absorbed by the particles but scattered or thrown to one side. Further, the individual transparent particles were identical in size and constitution, an unusual phenomenon in nature and a difficult one to produce in the laboratory. It appears that these transparent particles were actually globules of oil produced by the distillation of wood in the forest fires. The peculiar property of the oil globules is determined by their size. This was calculated to be one twenty-five-thousandth of an inch. Such a sized particle could only be seen with the aid of a powerful microscope.

There was another system of particles, localized in the smoke layer, which absorbed light of all wavelengths. Such a system of particles would constitute the carbon particles one would expect to find in the smoke of fires.

The "blue sun" occurrence is not unique but very rare. There have been others, usually connected with volcanic eruptions or sand storms in a desert.

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GENETICS

Uneven Chromosome Split

► SCIENCE now has its mystery of the missing chromosomes. When a germ cell divides in the process of building up the human body it has always been thought that the 48 chromosomes or particles within the cells, divide exactly evenly. Now Dr. R. A. Beatty, senior scientific officer of the Edinburgh University Genetics Laboratory, has told the British Association for the Advancement of Science that the neat picture of distribution of hereditary characters, that science has followed ever since the discovery of heredity by Gregor Mendel, is not true.

With the discovery of the chromosomes a classical picture was developed whereby the dividing fertilized germ cell equally

distributed its chromosomes between its daughter body cells, which in turn again made an equal distribution of chromosomes between their daughter cells, and so on.

This makes a nice tidy picture and explains observed genetic phenomena beautifully, but, Dr. Beatty pointed out, now that scientists have begun to count the chromosomes in the body cells they are learning it just isn't true. Some recent counts made of chromosomes in human cells from different tissues show a random deviation of the chromosome numbers from the expected 48. In most cases there were less than 48, though what happened to the missing chromosomes is still anybody's guess.

Further investigation of this unequal

chromosome distribution situation is of vital importance, as the Soviet school of Lysenkoist geneticists are claiming that it bears out their contentions on somatic-body cell—inheritance.

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EVOLUTION

Little Eohippus Not Direct Ancestor of the Horse

► THE ANCESTRAL family tree of the horse is not what scientists have thought it to be.

Prof. T. S. Westoll, Durham University geologist, told the British Association for the Advancement of Science at Edinburgh that the early classical evolutionary tree of the horse, beginning in the small dog-sized Eohippus and tracing directly to our present day Equinus, was all wrong.

The direct line of descendants of Eohippus led to a horse-like animal Hypohippus, which became extinct and so ended the line. It was from an offshoot of this line, starting a second line, and perhaps even from a further offshoot of the second line, that our modern horse, Equinus, eventually developed.

Prof. Westoll believes that all evolution is made up of such "finite stage" or blind alley patterns, with offshoots starting up new side lines. Through a series of these offshoots present animal stocks developed.

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METEOROLOGY

British Rain Starts As Ice High Up

► ALMOST all the rain that falls on England starts out as ice, regardless of the time of year, Dr. A. W. Brewer, Oxford University meteorologist, told the British Association for the Advancement of Science in Edinburgh.

What happens is that there are clouds of supercooled water drops and any drops which freeze grow rapidly because of the low vapor pressure on ice. Dr. Brewer finds that even if only a few ice particles are formed and grow quickly, they will fracture into numerous particles around which more pieces of ice will form, later to fall as rain and make England green. Previously the weather men were worried as to how nature furnished sufficient nuclei around which the ice crystals formed.

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CLIMATOLOGY

Climate Changed in 1300 A.D. in Europe

► ABOUT 1300 was a time of climatic change for northern Europe, studies of pieces of pottery and pollen indicate.

Dr. Axel Steensberg, of the National Museum of Copenhagen, told the British Association for the Advancement of Science meeting in Edinburgh, that the pottery and pollen show that the change in climate was not earlier than about 1250 and not later than 1325 to 1350.

Villages in Danish Zealand have been excavated in an attempt to discover what happened to the climate and why. Charred grain and wild seeds of various Middle Ages dates may throw light on the problem. About this time the Black Death devastated northern Europe.

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PHYSICS

Distance Best Protection

Shielding walls of lead or concrete are not necessary as defense against rays of radioactive materials used in industry.

► SHIELDING WALLS of lead or thick concrete are unnecessary and, in fact, undesirable for protecting foundry workers against stray rays from radioactive materials used for making radiographs of metal castings, a British metallurgist, J. S. Blair, told a group of scientists at the Isotope Techniques Conference in Oxford, England.

Shielding walls only cause dangerous back-scatter of the tissue-damaging rays, increasing the hazard to those working within the confines of the enclosure.

A simpler, safer and less costly procedure, said Mr. Blair, is to draw a 30-foot diameter circle, at the center of which the radioactive source is placed, and to instruct all

workmen to stay outside the circle when exposures are being made.

As the strength of the rays, following the inverse square law of all radiation, rapidly falls off with the square of the distance, beyond a 15-foot radius the amount of residual radiation from the commercial radioelements normally employed in industry is so small as to be no hazard.

The steel-penetrating gamma rays of the radioactive isotopes of cobalt, tantalum and iridium are being widely employed in England for detecting flaws in metal castings, whereas in the U. S. this job is still being done largely with X-rays, reported K. Fearnside of Isotope Development Ltd., Aldermanston, England.

Mr. Fearnside believes that the use of radioelements is a more practical proposition, as a small, easily maneuverable cylinder of metal, under an inch in each dimension, takes the place of the bulky and unwieldy X-ray machines.

This makes a great difference in the cost and time factors, especially when welds and repairs are to be radiographed in awkward situations on the job. Sometimes it may require three weeks to set up an X-ray machine to radiograph a particularly awkward installation, whereas the same job can be set up in a matter of minutes with a gamma ray source.

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MEDICINE

Pain in the Chest Not Always from Heart

► MANY PEOPLE think that chest pain is a sure sign of heart disease. But this is not necessarily true.

"Only a minority of individuals who seek medical advice for chest pain have heart disease," the American Heart Association declares in the first revised edition of its manual for physicians, "EXAMINATION OF THE HEART."

Of course the person who has a pain in his chest will be wise to consult his physician to find out what is causing the pain. A check with your doctor is wise in case of other symptoms which you may think have nothing to do with your heart disease. So-called indigestion, for example, may be a sign of stomach cancer or of heart disease.

The symptoms and signs of heart disease may be very much like those of disorders of other organs, the Heart Association points out. Trouble with blood circulation is often shown chiefly by disturbances in other organs than the heart. Examples are the lungs, kidneys, brain, stomach and intestinal tract, liver and feet and hands.

The heart and blood vessels, furthermore, may be involved secondarily by other diseases such as gland disorders, diet deficiencies, anemia, infection and cancer.

Because of all this, your doctor will not be satisfied just to "check your heart," as many a patient asks. The doctor will take a careful history and make a thorough physical examination to find whether your heart is all right or in trouble.

Many a person is unnecessarily worried by a sudden pounding or palpitation of the heart or a feeling that the heart has missed a beat. When a regular heart rhythm is momentarily interrupted by an early beat followed by a pause, a premature contraction, or beat, has occurred. Doctors call this an extrasystole. In most cases it is of no importance, but if you notice this often, see your doctor so he can make a careful examination to determine whether or not there is anything wrong with your heart.

Science News Letter, August 25, 1951



NEW COMET—A greatly enlarged view of the faint 1951 comet discovered on August 6 by Dr. Albert G. Wilson and Robert G. Harrington of the California Institute of Technology and Mt. Wilson and Palomar Observatories on a photographic plate made with the 48-inch Schmidt telescope at Palomar. It is only one ten-thousandth of the brightness necessary to be visible to the naked eye. The straight line below the comet is a star caught as the telescope tracked the comet.

INVENTION

**Creosoted Lumber
Now May Be Glued**

► CREOSOTED PIECES of lumber can be glued together to form heavy structural timbers by a method on which a patent has been issued by the government. Until this method was developed it was thought impossible to glue creosoted wood.

In the process, pieces of lumber which are to be glued together to form the heavy timbers are creosoted in the usual manner, even to the extent of high impregnation. Then thin layers of the surfaces to be bonded are removed by dressing or planing. The procedure from then on is the same as for untreated wood.

When wood is creosoted by the pressure method, creosote coated fibers are formed near the surface. Fibers deeper within the wood have received creosote only by penetration. The dressing process removes the creosote coated fibers, resulting in surfaces that glue will hold.

Inventors are Fred Denig, Pittsburgh, Pa., and Walter P. Arnold, Orrville, Ohio. They were awarded patent 2,563,821. Rights have been assigned to Koppers Company, Inc., Pittsburgh.

Science News Letter, August 25, 1951

MARINE BIOLOGY

**Living Organisms Exist
Six Miles Under Water**

► TINY living organisms exist in the famous Philippine Trough, one of the deepest parts of the ocean, six and one-half miles below the surface where the pressure is more than 15,000 pounds per square inch.

Dr. Claude E. ZoBell, professor of marine microbiology at the University of California's Scripps Institution of Oceanography is presently aboard the Danish scientific vessel *Galathea* in mid-Pacific and reported their existence.

In a letter to colleagues he revealed that living bacteria have been found in sediment cores taken from the bottom of the ocean off the Philippines at 10,380 meters or about 35,000 feet.

Dr. ZoBell's letter reported that he found approximately 100,000 bacteria per gram of mud in one core. The number is a little larger than he might have been expected to find, colleagues say.

Although it has been suspected that there are living things in the great deeps, the presence of bacteria in the recent cores is one of the first direct bits of confirming evidence. To live at such depths, under tremendous pressures and in very cold waters, creatures must be very specially adapted to their environment.

Using apparatus he designed himself, Dr. ZoBell has been able to reproduce the bottom conditions of great pressure and

low temperature in his laboratory aboard ship. The samples were transferred to his pressure bombs, elevated to 15,000 pounds per square inch, and there, under conditions identical with those of the natural environment, showed active bacterial growth, Dr. ZoBell wrote.

Science News Letter, August 25, 1951

NUTRITION

**You Can Use Chicken
For Thrifty Main Dish**

► CHICKEN will be plentiful and should be a good buy for protein food this coming month, the U. S. Department of Agriculture reports. For families who nevertheless find that chicken takes a big slice out of the food budget, and for those who are growing tired of fried, roasted and stewed chicken, the Agriculture Department's home economists suggest chicken scrapple. It makes a thrifty main dish as well as a good one, they say, and give the following recipe:

Ingredients for 8 servings: $3\frac{1}{2}$ cups chicken broth; 1 tablespoon all-purpose flour; 1 cup corn meal; $\frac{1}{2}$ teaspoon salt or 1 teaspoon if the broth has not been salted; $\frac{1}{4}$ teaspoon poultry seasoning; 2 cups ground or chopped cooked chicken.

To make: Heat half the broth in a double boiler. Blend flour, corn meal, salt, and poultry seasoning; mix with the remaining cold broth. Slowly stir the corn meal mixture into the hot broth. Cook, stirring until the mixture thickens. Cook for 30 minutes or longer. Stir in the chicken. Pour into a well-greased loaf pan. Cool quickly and refrigerate. When firm, cut in slices. Roll slices in flour and fry in a little hot fat until brown. Serve with chicken gravy.

Scrapple is a Pennsylvania Dutch dish, usually made with pork.

Other protein foods besides chicken which should be good buys because of plentiful supplies are fresh and frozen fish, cottage cheese, nonfat dry milk solids (powdered skimmilk) and peanut butter.

Science News Letter, August 25, 1951

MEDICINE

**Drugs Can Conquer
Spotted Fever Deaths**

► DEATHS from Rocky Mountain spotted fever can now "be practically eradicated," five doctors at the University of Maryland School of Medicine declare. The means for accomplishing this are the three antibiotic drugs, chloromycetin, aureomycin and terramycin. Terramycin, a relative newcomer to the group, seems as effective in this disease as the other two, the University of Maryland physicians, Drs. A. M. Powell, M. J. Snyder, J. V. Minor, J. P. Benson and T. E. Woodward, find.

Science News Letter, August 25, 1951

IN SCIENCE

METEOROLOGY

**Pressure Changes May
Help Predict Tornadoes**

► TORNADOES MAY be predicted in time enough to permit adequate warnings as a result of work being done at St. Louis University by Dr. Edward M. Brooks.

Dr. Brooks used a speeded up barograph which gives in greater detail sudden changes in barometric pressure. He confirmed, using this instrument, that a sudden rise takes place just before a thunderstorm breaks and he discovered that the rear side of a thunderstorm or shower may have a much sharper drop in pressure.

Dr. Brooks is seeking proof of his theory that a tornado is surrounded by a low pressure area of about ten miles and that tornadoes may occur when the pressure drops abruptly in the first portion of a thunderstorm if, at the same time, there is a strong wind blowing into the storm.

Now Dr. Brooks is waiting for a tornado. He believes that work done on a tornado itself is all he needs now to bear out his theory.

Science News Letter, August 25, 1951

ENGINEERING

**New Storage Battery
Uses Lead-Silver Alloy**

► A NEW storage battery for automobiles, which will give years of service longer than present types, has a unique grid. This is a framework of a lead-silver alloy with spaces filled with a lead composition in paste form as the active material.

Important also is the use of a milder electrolyte, which in reacting with the lead paste material does so with less expense to the battery life. Also important are separators to insulate the positive and negative plates in the battery. They are made of a special plastic material which has proved more efficient and enduring than those made of wood or rubber.

The new battery was developed by the Electric Storage Battery Company, Philadelphia.

The lead-silver grid was developed to minimize the problem of battery failure due to overcharging. It was tested over a six-year period in an experimental battery which contained two cells with the new grids and a cell with the conventional lead-antimony grid. At the end of the test, the new grids had many months of life left while two sets of the conventional grids had been worn out.

Science News Letter, August 25, 1951

SCIENCE FIELDS

NUTRITION

Shark Meat Made Suitable for Food

► SHARK meat may become a more important human food with a process of preparation for canning which brought patent 2,564,487 to Perry W. Mader and Gerstle I. Mader, Robertsdale, Ala. Rights are assigned to Food Research Institute, Inc., of Alabama.

Fresh shark meat, these inventors say, is toxic to men and dogs but shark meat is quite wholesome in the dried state or when semi-putrid. It is used in parts of the world as food but only when it has become partly rotten or dried. This new process removes from fresh meat the chemicals which cause the toxicity. The meat, still fresh, can then be preserved in cans and eaten with safety at any time.

The trimmed meat is boiled in an open kettle. A sudden release of a large amount of carbon dioxide in the boiling water is provided. Then the pot is allowed to boil over for a limited time. The harmful ingredients in the shark meat are carried out in the overboiling.

Science News Letter, August 25, 1951

GENERAL SCIENCE

NSF May Take Over AEC Fellowships

► MOST of the controversial Atomic Energy Commission fellowship program will probably be taken over by the new National Science Foundation in 1952-53, if Congress provides the funds to NSF. Only specialized fellowships, providing for study of direct use of the atomic energy program, will be continued by AEC.

One stumbling block in the transfer of the fellowship program, is the matter of security clearances now required by law. The National Science Foundation wants to steer as clear as possible of fellowship programs which require clearance by the FBI. At present the approximately 300 AEC fellows must be checked by the FBI.

A second stumbling block is the matter of appropriations. NSF has asked Congress for \$14,000,000 for the present fiscal year, but this has not been finally acted on as yet. (See p. 117.) It has not been decided whether AEC or NSF would provide the money for the fellowships.

Officials of the AEC say that most of their fellowships were for general education in science. They point out that, at the time the fellowship program was started, no other agency could do the job, which

was considered vital to the long-range defense of the country. Now, say these officials, the NSF, set up to do that sort of job, can carry on.

Shortly after the AEC program was begun, Congress required that all students be checked by the F. B. I. The National Research Council, which administered the program, protested and bowed out of the picture, except as advisers. The program now is administered by AEC's Oak Ridge Institute of Nuclear Studies.

Science News Letter, August 25, 1951

CHEMISTRY

New Test for Alkali Shows Soil Toxicity

► WHETHER or not alkali in the soil will interfere with the growing of plants may now be determined in 60 hours in many cases.

A new test developed under the direction of Dr. Roy Overstreet, professor of soil chemistry at the University of California's College of Agriculture, can check the soil any time of year in the laboratory. Materials necessary for correcting alkali soils can then be applied before a crop is planted.

"This is not a test of soil fertility," Dr. Overstreet emphasized. "It is a measure of soil toxicity. Alkali soils are usually fertile after the salts are removed."

The test can also check the efficiency and speed of materials used to correct an alkali soil.

Radish seedlings are used in Dr. Overstreet's test. Thirty-six hours after germination the seedlings are placed in a sample of alkali soil. The growth in the next 24 hours tells whether the soil contains too much alkali. Too much sodium and sodium salts in the soil inhibit plant growth.

Further experiments are now underway to find out if this test can be applied to other types of soils.

Science News Letter, August 25, 1951

INVENTION

Lawn Leaves Powdered To Make Humus

► LEAVES fallen from trees on the lawn are picked up, reduced to fine particles and returned to the grass to make humus by a manually-operated sweeper and disintegrator invented by Arvid Bjorklund, Minneapolis, Minn., on which patent 2,564,352 was issued.

It has a handle like a lawn mower for pushing, and geared wheels to operate the mechanism. It has rotating brushes much like a carpet sweeper to gather up the leaves. Inside is a disintegrator which includes a rotor with teeth. These convert the leaves into fine particles which are passed downward to the lawn.

Science News Letter, August 25, 1951

CHEMISTRY

Sulfur Recovered from Industrial Gases

► PART of the present shortage of sulfur may be met by a process for the recovery of the essential element from hydrogen sulfide and sulfur dioxide given off in certain industrial processes, particularly in refining petroleum oil and natural gas. The recovery of the sulfur in these by-product gases will not only obtain a valuable product but also prevent air pollution with gases harmful to animals and plants.

The inventors of this improved process for sulfur recovery are Robert Vose Townsend, Arlington, N. J., and Donald Hoyt Kelly, New Hyde Park, N. Y. Allied Chemical and Dye Corporation of New York City has acquired the rights to the patent, 2,563,437.

The process consists in passing the hydrogen sulfide through a solution made by contacting sulfur dioxide with a dilute aqueous solution of aluminum sulfate and sulfuric and sulfurous acid. Elemental sulfur settles out.

Science News Letter, August 25, 1951

CHEMISTRY

Four Raw Materials May Increase Cortisone

► CORTISONE for every arthritis sufferer now can become a reality instead of a hope. Final steps in synthesizing it from four substances abundant in nature have been taken by chemists at Merck and Co.

Cortisone by the new process will not be quickly plentiful. The process must be improved, supplies of raw materials must be assured and facilities for production must be built. But the availability of more cortisone for the future is now assured.

Merck chemists responsible for this feat are Drs. John M. Chernerda, E. M. Chamberlin, E. H. Wilson and Max Tishler.

The four natural substances they started with are ergosterol, diosgenin from the Mexican yam, stigmastanol from soy beans and cholesterol from the spinal columns of cattle and from wool fat.

First and most difficult step of synthesizing an allopregnane compound from these chemicals was announced by the Merck group in May. Now they report (JOURNAL, AMERICAN CHEMICAL SOCIETY, August) the final steps involving transformation of the allopregnane compound into cortisone.

In the same issue of the chemical journal, Harvard scientists announce completion of the final links between a steroid chemical made from simple starting materials and a series of chemical reactions known to produce cortisone. The Harvard work was done by two research teams, one headed by Prof. Louis F. Fieser and the other by Prof. Robert B. Woodward.

Science News Letter, August 25, 1951

ASTRONOMY

Jupiter Now Prominent

Brightest object in the sky, this planet is easy to locate low in the east on September evenings. Deneb-Vega-Altair form large triangle high overhead.

By JAMES STOKLEY

► FOR THE first time in several months, the planet Jupiter now appears on the accompanying maps, which shows the evening skies at about 10 o'clock, your own kind of standard time, on Sept. 1 and an hour earlier at the middle of the month. (Add one hour if you are on daylight time.)

With magnitude of minus 2.5, thereby exceeding in brilliance any star or other planet now visible, it is easy to locate, in the constellation of Pisces, the fishes.

Directly above Pisces a quadrilateral of stars forms the "great square" in Pegasus, the winged horse. The northernmost star in the square, that is, the one to the left, for it is resting on one corner, is actually not in Pegasus, but in the neighboring group of Andromeda.

Above Pegasus one comes to Cygnus, the swan, with a first-magnitude star called Deneb, which stands close to the zenith. It is at the top of the "northern cross," the rest of which extends toward the southwest. To the west of the cross, in Lyra, the lyre, is Vega, brightest star visible these evenings. Toward the south, we find Altair, in Aquila, the eagle. Deneb-Vega-Altair: these make a large triangle of stars, now high overhead, which is easy to locate.

Star Near Horizon

In addition, there are three other stars of the first magnitude visible these evenings, though all are near the horizon—so low that their light is considerably dimmed, on account of the greater thickness of the absorbing atmosphere through which it has to pass. In the northwest there is Arcturus, in Bootes, the bear-driver, which was high in the south at the beginning of summer. Capella, in Auriga, the charioteer, is seen in the northeast, the first harbinger of the bright stars that ornament the winter evening sky.

The third of these is Fomalhaut, in Piscis Austrinus, the southern fish, which is low in the south. Only in late summer and autumn does this southerly group come into view for us in the evening.

In addition to Jupiter, the planet Mercury makes a brief appearance in September, though just before sunrise rather than in the evening. On Sept. 16 it will be farthest west of the sun, and then will be seen at dawn, low in the east, near

the star Regulus, in Leo, the lion. Venus so conspicuous in our western evening sky until a month ago, is in line with the sun on Sept. 3 and invisible. However, by the end of September it will have moved far enough to the west that it will also be visible low in the east before sunrise. It will be very bright, of magnitude minus 4.2, so it will be easy to locate, and may even be followed into the sky after sunrise.

In September Mars is in the constellations of Cancer, the crab, and Leo, the lion. It rises a few hours ahead of the sun but is relatively faint, of the second magnitude, and will not be prominent. Saturn will be in the western evening sky at the beginning of September, though not easily visible, and on the 29th will be directly beyond the sun.

Origin of Drawings

A perennial puzzle among those who are beginning to study the stars is how anyone ever saw any resemblance between the stars of the constellation of Aquila, for example, and an eagle; or between those of Aquarius, which is shown on our maps in the southeast, and a man with a jar from which a stream of water is flowing. Yet, on the old star maps, this is the way these were pictured, while other groups had equally far-fetched interpretations.

Actually these figures go back to a famous artist and engraver of the early 16th century, Albrecht Durer of Nuremberg. Of course, they have been modified in the passing years since his time, and some new constellations have been added, but the essential appearance of such groups as Orion, the Great Bear, Pegasus, Cassiopeia and others is still much as Durer drew them.

Long before the birth of Christ, the Egyptians, and the Chinese as well, made outlines of the constellations. Probably the names of many of the groups we use originated in Mesopotamia. In Greece, Homer and Hesiod mentioned many of these. There grew up a mythology connected with the stars, though it is not known just how they did picture the figures around the stars.

About 127 B.C., a Greek astronomer, Hipparchus, catalogued the principal stars. His successor, Claudius Ptolemy of Alexandria, Egypt, published these in 136 A.D. in his great work, which is known as the *Almagest* from its Arabic translation through which it first became known to European science. He listed 48 principal constellations.

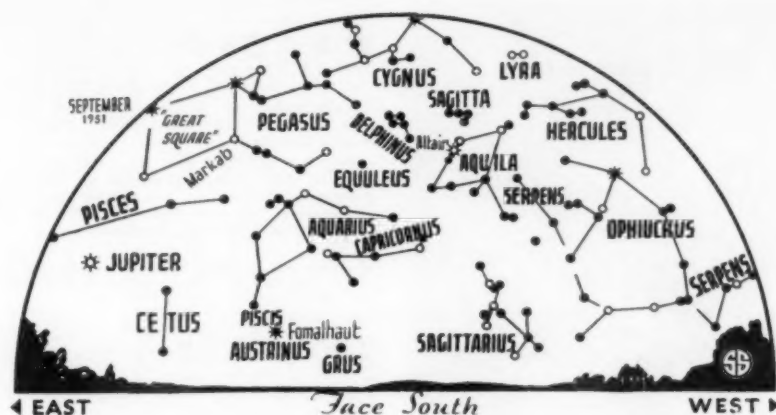
Published in 1515

It was in 1515 that Durer published two star maps, one for the northern hemisphere of the sky and the other for the southern, in the form of wood cuts. A mathematician of Nuremberg, named Heinfogel, laid out the stars, according to Ptolemy's list, but Durer's genius was responsible for the figures around them.

In 1603 Johann Bayer, of Augsburg, published a famous set of star maps, called the *Uranometria*, in which he introduced the practice, still followed, of designating stars by a Greek letter, in order of brightness within the constellation, followed by the Latin name (in the genitive case) of the group. Thus Deneb, as the brightest star in Cygnus, is alpha Cygni. For the figures, Bayer closely followed Durer, as did later astronomers who also published star maps. Thus, the Durer figures became classic, and it is fortunate that they originated with so able an artist.

However, there have been many attempts to introduce other figures around the stars. St. Bede, the English theologian, who died in 735 and is generally known as "The Venerable Bede," was dissatisfied with





◀ EAST Face South WEST ▶
 ☆ ★ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Christians using the old pagan names, and proposed that the 12 constellations of the zodiac, through which move the sun and planets, should be named after the apostles.

This was actually done by Julius Schiller, of Augsburg, a friend of Bayer's, who published his own Christian star maps in 1627. Aries the ram, for example, became St. Peter, since it is considered as the first of the zodiacal constellations. Lyra was turned into the manger, Cygnus into the cross, and Cassiopeia into Mary Magdalene.

A different sort of reform was attempted later in the 17th century by Erhardt Weigel, of the University of Jena, who wanted to make the constellations represent the coats of arms of the various royal families of Europe.

The latest such attempt came about a decade ago when an English journalist, A. P. Herbert, who was member of Parliament for Oxford University, but was better known as a contributor to Punch, seriously proposed a new set of constellations. One of his ideas was that the stars in Aquila, and the nearby group of Delphinus, the dolphin, should be called the Music Makers, and individual stars in it named after Bach, Mozart and other great musicians. Draco, the dragon, in the northern sky, he wanted to call the Tyrants, and name the stars Hitler, Attila, etc. Needless to say, this idea was soon forgotten and the old names are

still with us, as they probably will be for a long time to come.

Celestial Time Table for September

Sept.	EST	
1	7:49 a. m.	Now moon, with annular eclipse of sun visible in North Carolina and Virginia and partial eclipse visible over eastern U. S.
3	10:00 a. m.	Venus between earth and sun
8	1:16 p. m.	Moon in first quarter
10	2:22 a. m.	Algol (variable star in Perseus) at minimum brightness
11	3:00 p. m.	Moon nearest, distance 228,200 miles
12	11:11 p. m.	Algol at minimum
15	7:38 a. m.	Full moon
	7:59 p. m.	Algol at minimum
16	11:00 a. m.	Mercury farthest west of sun—visible for a few days as morning star
	9:04 p. m.	Moon passes Jupiter
18	4:48 p. m.	Algol at minimum
22	11:13 p. m.	Moon in last quarter
23	3:38 p. m.	Sun over equator, autumnal equinox which marks beginning of autumn in northern hemisphere
	4:00 p. m.	Moon farthest, distance 251,200 miles
27	3:32 p. m.	Moon passes Mars
	11:40 p. m.	Moon passes Venus
30	8:57 p. m.	New moon

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, August 25, 1951

Laboratory, Children's Medical Center, Boston, Mass. They are: Drs. Fred H. Allen, Jr., Louis K. Diamond and Bevely Niedziela.

The Kidd group is dominant, they found; two parents having it may have children who lack it, but two parents negative to it cannot have a baby who is positive.

The new blood group antigen is present in the red blood cells of 77% of Americans and the same proportion in England.

Science News Letter, August 25, 1951

PHYSIOLOGY

If You Look at Eclipse Take Care of Your Eyes

► IF YOU LOOK at the solar eclipse Saturday morning, Sept. 1 (See SNL, July 28), be sure to protect your eyes. Even though the sun will rise partially eclipsed for many in the central and eastern states, observers should look at this heavenly show through several layers of overexposed photographic film or a piece of glass densely smoked by candle flame.

Each solar eclipse takes its tragic toll of vision. The delicate interior membranes of the eye cannot withstand even the partially eclipsed glare of the sun without special protection, reports the Better Vision Institute.

Sunglasses, and even welder's goggles, afford inadequate protection. Ninety-nine percent of the sport glasses that people buy transmit over 80% of the light and are totally inadequate for looking at the sun, reports the Joint Committee on Industrial Ophthalmology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology.

People sometimes try to protect their eyes while looking at an eclipse by peeping through their fingers or through a pin-hole in a card. Such methods are usually inadequate if the glare is bright.

Science News Letter, August 25, 1951

INVENTION

Better Concentrated Coffee With Steam Treatment

► BETTER COFFEE of the concentrated type is promised by Lee Nutting, Berkeley, Calif., by a process to retain full flavor on which he was awarded patent 2,562,206. Rights are assigned to Hills Bros. Coffee, Inc., San Francisco. In his method the ground roasted coffee is treated with steam to remove the volatile constituents. These are collected from the steam and returned to the beverage brewed from the coffee after the brew has been greatly reduced in volume by an evaporation method. The mixture is then completely dried to give the final product.

Science News Letter, August 25, 1951

GENETICS

Blood Group Inheritance

► A TENTH human character has been added to the nine others for which the manner of inheritance is known. The new character of known inheritance is a blood group named Kidd, or Jk^a, after the baby in which it was first identified last year in Boston, Mass. Of the other nine, seven are also blood groups. The others are ability to taste phenyl thiocarbamide, a chemical intensely bitter to some persons and taste-

less to others, and the secretion of the ABO antigens in saliva.

The way in which the new blood group is inherited is reported (NATURE, Aug. 4) by an international research team of scientists. Two members of the group are at the Medical Research Council, Blood Group Research Unit, Lister Institute, London. They are Drs. R. R. Race and Ruth Sanger. The Americans are at the Blood Grouping



FREEDOM BALLOONS—These are the pillow-like plastic balloons used to send freedom messages to the people behind the iron curtain. "Svoboda" is Czech for freedom. Here the balloons are being inflated.

METEOROLOGY

Freedom Balloons Aimed

► **BALLOONS** carrying messages of freedom to people behind the Iron Curtain can be aimed at the desired target with a good chance that they will get there.

Knowledge of the upper air flow, the changes which might occur in it because of weather influences from over a wide area, and variations which already exist in the pattern can tell the balloon flyer where his messages will go and how long they will take to get there.

Various bursting devices, set for the proper time, can bring the messages to earth on the desired target. Some bursting devices operate on the pressure principle, bursting at a pre-determined height. By computing the trajectory of the balloon in advance, which can be done accurately, it is possible to know at just what altitude the balloon should burst so the messages will be brought to earth at the proper point.

Balloons can travel long distances, as the Japanese demonstrated during World War II, when they launched balloons designed to set fires in the American Pacific Northwest. However, the greater the distance, the less likelihood one balloon will hit the target. This can be solved by sending out a greater number of balloons.

American meteorologists and cosmic ray specialists use helium in the balloons they

send into the upper atmosphere to collect information. Hydrogen is the gas being used in the balloons now being sent into the Iron Curtain countries.

Balloons are now being made of three types of material—plastic, natural rubber and neoprene, a synthetic rubber. This will probably be the first chance people behind the Iron Curtain will have to see this new American synthetic. Ultraviolet rays do damage to natural rubber, but the new neoprene balloons avoid this trouble.

Science News Letter, August 25, 1951

INVENTION

Grass Fires Put Out by Tractor-Trailed Dirt Blower

► **FIRES** IN fields of grass, grain or low brush may be extinguished with a trailer to a farm tractor which picks up fine dirt from the ground and discharges it on the burning materials. Scrapers positioned ahead of a rotary brush reduce the earth to a fine dirt which the brush can pick up. A suction fan blows the collection out through a discharge spout which is pivoted so that it can be swung from the rear to either side. Patent 2,561,701 was awarded to John E. Hurlbert, Dishman, Wash.

Science News Letter, August 25, 1951

● RADIO

Saturday, Sept. 1, 1951, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. W. Albert Noyes, Jr., chairman, Department of Chemistry, University of Rochester and chairman, Division of Chemistry and Chemical Technology, National Research Council, will discuss "World Chemical Conclave."

PHYSIOLOGY

2,000,000 Filters Function in the Kidneys

► **MANY** of you have read dramatic reports of lives being saved by artificial kidneys. You may have been surprised at the large, bulky apparatus which obviously is much larger than the kidneys in the human body. This is not so surprising when you learn that the two million little filtering units in the kidney would, if stretched out, extend about four miles. A simple explanation of the construction and functioning of the kidneys is given by the Illinois State Medical Society as follows:

The chemical waste products of the diet are eliminated by the kidneys. When these organs are not functioning properly, a condition develops which is known as nephritis. It is often called Bright's disease after the famous London physician, Dr. Richard Bright, who, in 1827, correlated swelling body tissues (dropsy) with coagulation of urine on boiling, and inflammation of kidneys.

Normally there are two kidneys, one on either side of the spinal column. They are bean-shaped, located in the upper part of the abdomen, beneath the diaphragm, behind the stomach and directly in front of the muscles of the back. The kidneys are each connected to the bladder by two long tubes, known as the ureters, and their primary function is to act as a filter in removing waste products from the blood stream.

The kidneys may be considered the most important chemical laboratory in the body, as they not only filter the waste products but conserve the body's minerals and salts and keep body fluids and chemicals in balance. They are so important that all the blood in the body, 11 to 13 pints, circulates through them every three minutes for the purpose of being freed of its waste products.

The filtering units of the kidneys are called glomeruli. They are clusters of blood vessels. As the blood circulates through the kidneys and finally through the little clusters or glomeruli, the waste products are selectively transferred from the blood into tiny funnel-like tubes, known as kidney tubules. In addition to the waste products, large quantities of water, sugar and salt pass into these tubules. This is known

as filtrate. As this filtrate passes down through the tubules, the water, salt and sugar essential to the body are reabsorbed through the walls of these tubules to maintain the normal body chemistry. The waste products, however, that cannot be used again continue to pass down the tubules

and down the ureters into the bladder.

When anything interferes with these filters, such as blocking or plugging, the waste products are not properly processed, inflammation develops and we have the condition known as nephritis.

Science News Letter, August 25, 1951

MEDICINE

Young Heart Victims Old

► MEN WHO get heart disease before they are 40 seem at least 10 years older than they are.

This is "one of the most striking observations" made on a group of 100 heart patients aged 23 to 40 and reported in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Aug. 4).

The 100 patients came from all parts of the country east of the Rocky Mountains to be studied by eight medical scientists at the Massachusetts General Hospital and Harvard Medical School, Boston.

Besides looking older than their years, the under-40 heart patients were shorter and wider than a control group of healthy persons the same age. They were of mesomorphic (muscular) body build with an increased chest diameter from front to back, but they did not weigh more, on the average, than the healthy control group.

Most of the acute heart attacks in this group of patients occurred during the time of day when most people are at work, 7:30 a.m. to 7 p.m. This, the doctors

state, does not prove a direct cause and effect relation between effort and heart disease but makes it reasonable to conclude that activity may influence the rate of occurrence of heart attacks.

Heart attacks occur more often in the late fall, winter and early spring.

Almost two-thirds, 64%, of the patients had symptoms before the acute attack. In 95% of the cases, pain over the heart or under the breastbone came on just before the acute attack.

Of the 97 men and three women, 32% were of British Isles mixture and 27% were Jews.

Each clue suggested by the findings on these patients must be carefully studied, the doctors stress, since each clue may bring closer the final solution of the cause of coronary heart disease.

Members of the research team are: Dr. M. M. Gertler, Comdr. M. M. Driskell (MC) U. S. N., Drs. E. F. Bland, S. M. Garn, J. Lerman, S. A. Levine, H. B. Sprague and P. D. White.

Science News Letter, August 25, 1951

NATURAL RESOURCES

Good Fuel from Lignite

► AMERICA'S vast deposits of lignite give promise of becoming a valuable fuel with a new process revealed by the U. S. Bureau of Mines that reduces it to a char of high heating value and at the same time yields crude coal tar from which many coal tar products can be obtained.

The process can be used also to make valuable fuel and obtain coal tar products from the low-grade non-coking bituminous coal with which the western United States is well supplied. According to V. F. Parry, chief of the Bureau's laboratories at Denver, Colo., where the process was developed, it is applicable to any coal of lesser rank than high volatile bituminous B, a bracket that encompasses 90% of all western coal.

The process, as described by Mr. Parry, consists in crushing the lignite or other non-coking coal into particles of one-quarter-inch or less in size. The material is then "boiled" at 350 degrees Fahrenheit in a fluidized dryer that uses the hot products of combustion or flue gas as the heating medium.

Then the hot dry fuel is moved to a carbonizing reactor, where it is burned

with air at a temperature of 950 degrees Fahrenheit to extract the coal tar and obtain a char. The bone-dry char has a heating value about 50% greater than raw lignite containing 35% moisture. Also it has a weight of only 45% of the raw lignite.

Raw lignite, known also as brown coal, is now mined and used in the United States in a quantity approaching 3,000,000 tons a year. It is used, however, largely in regions relatively near where it is produced because it deteriorates rapidly in the air. As mined, it contains from 30% to 40% of moisture, and when dried in air it slacks and ignites.

The principal known deposit of lignite in the United States is in North Dakota and about two-thirds of that mined is produced in that state. South Dakota, Montana and Texas have considerable supplies. The new process will be given its first commercial application at a new aluminum smelting plant in Texas. The char obtained will be used to provide power to drive generators to make the large quantities of electricity required in aluminum making.

Science News Letter, August 25, 1951

METALLURGY

Aluminum-Magnesium Casting Alloys Made

► ALUMINUM-magnesium alloys, suitable for either chill or sand casting, which have high tensile strength and ductility, are made by a process on which Charles B. Willmore, North Aurora, Ill., received patent 2,564,044. William F. Jobbins, Inc., of Aurora, Ill., was awarded the patent.

The chief difference between chill casting and sand casting lies in the rate of heat loss through the mold walls. In molds of sand it is slower than in permanent molds of metals or other materials in which the so-called chill casting takes place. Chill casting usually has the effect of decreasing grain size of the cast alloys, particularly when they are composed of an aluminum base.

In these aluminum-magnesium alloys, the magnesium content is less than 9% by weight. The improved properties are secured by the addition of very small quantities of titanium, beryllium, boron, and manganese or chromium. The castings have the desired improved physical properties without any following heat treatment.

Science News Letter, August 25, 1951

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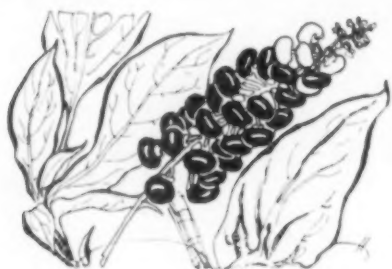
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Pokeberry

➤ ALMOST ALL of our commonest weeds are foreigners; for it seems axiomatic that an ill weed thrives best away from its own home. But one American plant can claim the somewhat doubtful distinction of sometimes amounting to a troublesome weed on its native heath.

This is the pokeberry, or pokeweed, also known simply as poke, and as scoke and garget. It is a tall, thick-stemmed, abundant-leaved plant, liking moist, rich land, especially newly-broken plowland and clearings.

Weed though it is, it is not without redeeming qualities. Prof. Liberty Hyde Bailey, who always has the right word when it comes to botanical description, calls it "a robust plant of heavy odor, but of good habit and clean." The pokeweed adds color to the corners with stiff bunches of berries that are so purple they are almost black.

These same berries yield quantities of most amazingly purple juice, which children often make into ink for their own amusement and their mother's despair. They might do for a dye, but the color has never yet been fixed. It is another case of a possible occupation for a vegetable gone because of competition from aniline and other dyes.

In earlier days, and to a certain extent still, the thick, asparagus-like shoots of the pokeweed furnished pot herbs. They were a trifle rank in taste unless taken in the very flush of their crisp infancy, but in the lack of asparagus would do all right. They were even cultivated once, but that has passed, too.

The roots of the plant are yellow and intensely bitter, yielding a violent purgative drug. Eaten by accident for horseradish, they have caused serious illness and even death.

Robbed of all its possible occupations, is it any wonder that the pokeberry has become a vagabond and a weed?

Science News Letter, August 25, 1951

ENGINEERING

Engine Knock Studied

➤ THE KNOCK in the automobile engine that causes loss of power and sometimes damage to the engine itself is under scientific investigation at the National Bureau of Standards. New knowledge relative to the mechanism by which it is produced has been obtained.

The final objective of the investigation is fuel conservation. With the great increase in the number of motor vehicles now in use, and warnings of possible petroleum shortages in the future, it is essential that methods be found for getting more useful work out of the liquid fuels employed. The investigation of knock is a part of a study in compression-ignition being made by W. J. Levedahl and F. L. Howard of the Bureau staff.

Probably the best single way to reduce fuel consumption in the automotive engine is to increase its compression ratio, the scientists state. This means in effect increasing the pressure at which the fuel is burned in the combustion chamber. This raises the temperature of combustion and hence raises the amount of heat energy per unit of fuel that is made available to do work.

PSYCHOLOGY

Tell Child He Is Loved

➤ PARENTS HAVE been getting much advice in recent years about the importance of making a child feel secure so that he will grow up without neurotic, personality-warping fears. The way to make him feel secure, they are told, is to make him feel loved and wanted.

But many a father and mother has undoubtedly felt like answering this advice with: Of course I love my child. Don't I slave all day cooking and cleaning, or working at the office, to give him a good home and food, clothes and toys and things other children have? What more does it take to make him know I love him?

Tell him you love him, is the way Dr. Virginia Edgar of New York City would answer this. Tell him in words and other ways many times and day after day, she advises in a report from the National Hospital for Speech Disorders. Tell him also with a warm hug as he passes by or when he comes in from play, or by a quick kiss on the cheek "for no reason at all" or by a special smile when he comes into the room.

To parents who protest that they are by nature undemonstrative and cannot easily show their feelings, Dr. Edgar says it will come easier with practice. And if the child seems stand-offish, self-sufficient and independent, he nevertheless needs to be told

However, if the compression ratio is increased beyond the limit allowed by the fuel, detonation, or knock, occurs. This means loss of power and possible damage to the engine. Although the problem has been recognized for many years, it is still only partially understood.

The investigators have found that in normal, non-knocking combustion the flame initiated at the spark plug travels evenly across the combustion chamber, generating pressure on the piston. In knocking combustion the flame progresses for a time in the same way. Ultimately, however, some of the unburned charge, known as the "end gas," is compressed to a high pressure which causes it to ignite spontaneously and burn with explosive violence.

In the studies, it is expected to find a way of correlating knocking characteristics of fuels with their chemical structure. Experiments have been carried out on several fuels of various chemical structures. Work on the burning mechanism of fuels is continuing. While the first objective is to gain more knowledge of knock and how it is produced, the second is more efficient utilization of fuels.

Science News Letter, August 25, 1951

that his parents love him and are happy he is part of their lives.

Another way a parent can show love for a child is to devote a portion of each day to the child alone. At this time, give the child undivided attention. Don't try to teach him anything. Just sit with him and accept him and enjoy him. Play with him or read to him or sing with him if he asks you to. Tell him you came to sit with him because you like to be with him. You will learn to understand him better and be less annoyed by some things he does and he will do fewer things to annoy you simply to get your attention.

Science News Letter, August 25, 1951

MEDICINE

Radioiodine Combats Thyroid Diseases

➤ SOME 225 hospitals and clinics throughout the United States are now using radioactive iodine for treatment of thyroid gland diseases including cancer, Atomic Energy Commission figures on shipments of reactor-produced radioisotopes show.

More than 1,000 cases of hyperthyroidism have been treated with radioactive iodine and in 95% the disease was brought under satisfactory control.

Science News Letter, August 25, 1951

Books of the Week

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ACCULTURATION AND MATERIAL CULTURE, I—George I. Quimby and Alexander Spoehr—*Chicago Natural History Museum*, 40 p., illus., paper, \$1.00. Impact of Western Civilization on the native cultures of Oceania and North America as measured by the improvement in tools and other everyday articles.

ARCHITECTS OF AVIATION—Maurice Holland with Thomas M. Smith—*Duell, Sloan and Pearce*, 214 p., illus., \$4.00. The story of men who pioneered in aviation designing. With a preface by Jimmy Doolittle.

BIBLIOGRAFIA DE LA MATERIA MEDICA MEXICANA—Francisco Guerra—*La Prensa Medica Mexicana*, 423 p., illus., \$8.25. Containing 5,357 references to books and other publications on the medical properties of Mexican drugs. In Spanish.

EDUCATORS GUIDE TO FREE SLIDEFILMS: Third Annual Edition, 1951—Patricia A. Horkheimer and John W. Diffor, Editors—*Educators Progress Service*, 3rd Ed., 151 p., paper, \$3.00. Index to these important visual aids which can be obtained economically and in almost any subject.

FRUSTRATION IN ADOLESCENT YOUTH: Its Development and Implications for the School Program—David Segel—*Govt. Printing Office*, 65 p., illus., paper, 25 cents. A boy or girl in school is frustrated when what he studies does not appear to him related to his life and needs and when he cannot reach the goal of good marks. Here, an Office of Education specialist suggests how frustration can be reduced.

THE FUNDAMENTAL ASPECTS OF LUBRICATION—Otto A. Beeck, Chairman—*New York Academy of Sciences*, 237 p., illus., paper, \$4.00. Papers presented at a symposium in 1950.

I WONDER WHY—Thomas I. Dowling, Kenneth Freeman, Nan Lacy, and James S. Tippet—*John C. Winston*, 124 p., illus., \$1.44. First graders will learn how to read and learn basic scientific facts in Book I of a series.

LEARNING WHY—Thomas I. Dowling, Kenneth H. Freeman, Nan Lacy, and James S. Tippet—*John C. Winston*, 218 p., illus., \$1.76. Third grade curiosity about such things as friction, animals, common kitchen machinery etc. is satisfied from a scientific viewpoint in this reader.

THE MEMBRANE FILTER IN SANITARY BACTERIOLOGY: Public Health Report, Volume 60, No. 33—Harold F. Clark, Edwin E. Geldreich, Harold Jeter, and Paul Kabler—*Govt. Printing Office*, 35 p., illus., paper, 15 cents. Official report of the development and application of techniques which will greatly reduce the time, labor and space required for testing water. (See SNL Aug. 18, p. 103.)

THE OIL-SHALE INDUSTRIES OF EUROPE—Boyd Guthrie and Simon Klosky—*U. S. Bureau of Mines*, Report of Investigations 4776, 73 p., illus., paper, free upon request to publisher, 4800 Forbes Street, Pittsburgh 13, Pa. Although the production of liquid fuels and chemicals from oil shales is relatively new in the U. S., it is an old story in Europe.

PERSONALITY AND POLITICAL CRISIS: New Perspectives from Social Science and Psychiatry

for the Study of War and Politics—Alfred H. Stanton and Stewart E. Perry, Eds.—*Free Press*, 260 p., \$3.75. Lasswell, Sullivan, Levy, Klineberg and other social scientists, specialists in interpersonal and international relations, contribute chapters to this attempt to give understanding of the world we live in.

PITTSBURGH'S MELLON INSTITUTE—William A. Hamor—*Mellon Institute*, 4 p., illus., paper, free upon request to publisher, 4400 Fifth Avenue, Pittsburgh 13, Pa. Describing the equipment and research at this institution.

SEEING WHY—Thomas I. Dowling, Kenneth Freeman, Nan Lacy, and James S. Tippet—*John C. Winston*, 188 p., illus., \$1.60. Pupils in the second grade learn the importance of observation with this combination scientific-reader.

SPACE MEDICINE: The Human Factor in Flights Beyond The Earth—John P. Marbarger, Editor—*University of Illinois Press*, 83 p., illus., \$2.00 paper or \$3.00 cloth. Serious discussions of how and whether man can live and function on other planets or on a man-made satellite circling the earth in outer space.

SPECIFIC METHODS OF ANALYSIS—Samuel E. Q. Ashley—*New York Academy of Sciences*, 124 p., illus., \$2.50. The improved methods described provide an important research tool in a number of the sciences.

TENTH SEMI-ANNUAL REPORT OF THE ATOMIC ENERGY COMMISSION—U. S. Atomic Energy Commission—*Govt. Printing Office*, 151 p., paper, 35 cents.

THE WORLD OF COPERNICUS: Sun, Stand Thou Still—Angus Armitage—*New American Library*, 165 p., illus., paper, 35 cents. Pocket edition of a book originally published by Henry Schuman, Inc., this complete edition includes a history of astronomy before Copernicus, his biography and the eventual triumph of the Copernican Theory.

Science News Letter, August 25, 1951

ICHTHYOLOGY

Electric Fishing Net Predicted for Ocean

► THE development of an electric fishing net "in which fish are as helpless as dust particles in a vacuum cleaner" is predicted by Dr. Carl L. Hubbs and John D. Isaacs of the University of California's Scripps Institution of Oceanography.

Here's how an electrical net for collecting fish specimens would work: A negative pole would be placed at the outside of the net, a positive pole would be placed at the center. Electrical supply on fishing and research vessels would be adequate for the work.

A number of experiments leading to such a net have already been made.

Experiments on the reactions of fish in an electrical field have been conducted for several years by the California Academy of Sciences as part of the California Coopera-

tive Sardine Research Program. Research has shown that all normal reactions to sound, light, and so on, are suppressed when the fish are in the presence of the field.

Dr. Karl F. Lagler, of the University of Michigan, and Andreas B. Rechnitzer, of the Scripps Institution of Oceanography, have been experimenting with electrofishing as a way of taking fresh-water fish from very shallow, obstructed waters.

Electrofishing in the ocean has long interested fisheries men and scientists. An electrical net is reported to have been developed recently in Russia.

Science News Letter, August 25, 1951

CHEMISTRY

Purer Ragweed Pollen Extract Fights Hay Fever

► THE NATION'S hay feverites may sneeze and suffer less, thanks to a new ragweed pollen extract developed by Drs. Theodore B. Bernstein and Raymond P. Mariella and Miss Anne L. Mosher of Northwestern University, Evanston, Ill.

The extract will be used in treatment of patients for the first time this summer. It is reported to be purer and more powerful than previous pollen extracts. It can be used in skin tests for hay fever as well as in immunization against the allergy.

The Northwestern scientists estimate that their extract is almost 100% pure, compared to material formerly used which was almost 40% impure. The new extract is made by dripping yellow ragweed solution through a glass tube filled with a special acidic aluminum oxide. The acid wash removes both pigments and impurities.

Science News Letter, August 25, 1951

INVENTION

Patent Device to Keep Furnace from Smoking

► NO SMOKE will belch from furnace stacks with a device which automatically injects air and steam into the combustion zone of the furnace whenever dense smoke collects in the upper part of the combustion chamber. The result is complete combustion of the particles of fuel, soot and combustible gases that form the smoke. The invention is usable with any type of fuel that might make smoke.

The device is actuated when the density of the smoke in the upper chamber is great enough to cut a beam of light that falls on a photoelectric cell. Injection continues for a predetermined period of time, regardless of the condition of the smoke detector device. It creates a turbulence in the combustion chamber and the air materially aids combustion.

Inventor is Conway Pierce of Detroit, Mich. Patent 2,562,507 was awarded to him.

Science News Letter, August 25, 1951

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 584. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **FIRE WARNING** device for aircraft has a lead sulfide electric cell sensitive to infrared radiation which reacts to the flicker or varying intensity of a flame. Developed by the U. S. Air Force, it is not affected by overheat or bright sunlight but can detect a small gasoline fire at ten feet.

Science News Letter, August 25, 1951

❁ **PLASTIC** mattress cover for the youngster's crib fits easily over the top, ends and sides of any standard-sized crib mattress. It makes no rustle or crackle to disturb the baby, and is easily cleaned. Ordinarily this is done just by wiping but it can be boiled for sanitary cleaning.

Science News Letter, August 25, 1951

❁ **CHROMATE** coatings on zinc and cadmium are obtained by the simple process of immersing the article for less than one minute at room temperature in a solution of a special salt containing chromic acid. The salt comes as a powder, but is hygroscopic and must be kept in a tight container.

Science News Letter, August 25, 1951

❁ **DISH DRAINER** for the household kitchen is made of steel wire like many others but the wire is coated with neoprene, a synthetic rubber that eliminates much of the breakage of china and glass ware. This coating is highly resistant to grease, fats, oils and heat.

Science News Letter, August 25, 1951

❁ **PLASTIC POLES** with wood cores, to permit workmen on the ground to use with safety various tools on overhead wire carry-



ing high voltage electricity, come in lengths from two to 20 feet and are fitted for the easy attachment of the tools. Many types of tools can be used with this non-conductive pole shown in the picture.

Science News Letter, August 25, 1951

❁ **IDENTIFICATION** brands are put on conductors of various electrical systems by a typewriter-like machine with a standard keyboard that types letters on vinylite tubing used on wire terminals. By means of a special heating device, letters are heat-branded below the surface of the tubing.

Science News Letter, August 25, 1951

❁ **ICE CREAM PLANT**, a portable type about the size of a large office desk developed by the Army for use in advanced areas, is built as a unit containing a power plant, compressor, mixer and freezer. The capacity is limited to the 40-gallon storage space of the hardening cabinet.

Science News Letter, August 25, 1951

❁ **CLEAR-VISION** mirror for the bathroom cabinet is electrically heated just enough to keep it free from moisture. The heating element is covered with a layer of conductive chemical rubber which has high resistance to deterioration from heat. Electric current is turned off or on at will.

Science News Letter, August 25, 1951

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Do You Know?

The principal area in which the destructive *oak wilt* is killing oak trees is in southern Wisconsin and Minnesota and northern Indiana and Iowa.

Some 20 miles or more below the surface of the earth is a layer of hot rocky material called *basalt*; it is hot enough to melt but the great pressure on it keeps it solid.

Brazilian *carnauba wax* is used in America to make high-grade polishes, carbon paper, stencils, phonograph records, electric insulation, special inks and water-proof paper.

Various kinds of small birds, among them the hermit thrush, place live *ants* in their feathers, apparently to rid themselves of feather lice.